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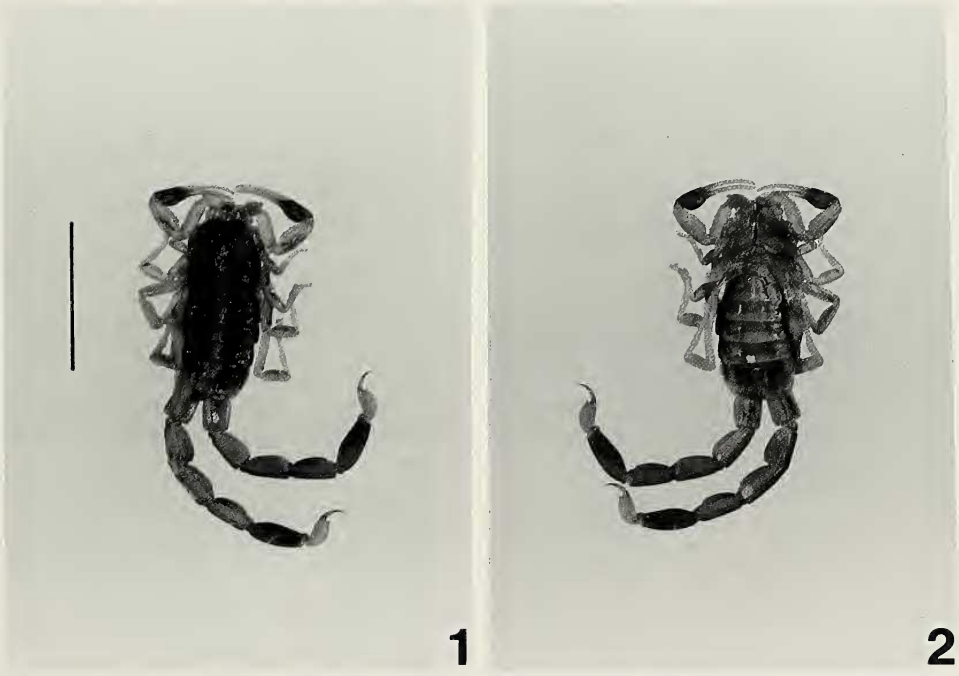
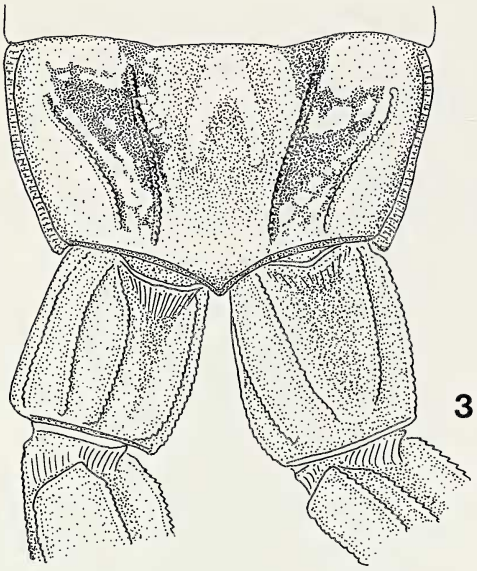
RESEARCH NOTES

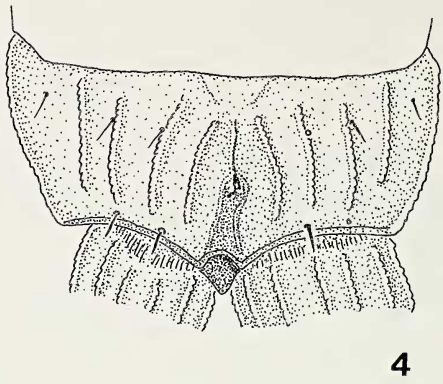
REPORT ON A RARE DEVELOPMENTAL ANOMALY IN THE SCORPION, *CENTRUROIDES VITTATUS* (BUTHIDAE)

While perusing scorpion samples to delineate the distribution of *Centruroides vittatus* (Say) in the central United States, we discovered a specimen in the collection of the Emerson Entomological Museum of Oklahoma State University with two fully formed metasomas and telsons (Figs. 1, 2). This anomaly, involving complete duplication of the metasoma and telson, has been reported very rarely in the past. Although known in ancient times (see Vachon 1953), it was first described in the modern literature by Pavesi (1881) in the chactid, *Euscorpius germanus* (Koch). Duplicate metasomas and telsons have since been reported in *E. carpathicus* (Linnaeus) and in several buthids, including *Buthacus leptochelys* (Hemprich & Ehrenberg), *Androctonus crassicauda* (Olivier), *Hottentotta* (= *Buthotus*) *alticola* (Pocock), *Centruroides infamatus* (Koch), *C. gracilis* (Latreille), *C. margaritatus* (Gervais) and *C. exilicauda* (Wood) (= *C. sculpturatus* Ewing) (Berland 1913; Brauer 1917; Campos 1918; Franganillo 1934; Millot & Vachon 1949; Vachon 1953; Williams 1971; Armas 1977). In a few cases (i. e., in *E. germanus*, *B. leptochelys*, and *C. gracilis*), the duplication involves part of the mesosoma as well, with the bifurcation arising at the level of mesosomal segment III or IV. Brauer (1917) demonstrated that the condition results from splitting of the posterior part of the embryonic germ band. In his study of 5000 embryos of *E. carpathicus*, duplication-type anomalies appeared in 13 specimens; of these, only one (or 0.02%) involved potential duplication of the metasoma.



Figures 1, 2.—Anomalous specimen of *Centruroides vittatus*. 1, Dorsal view; 2, Ventral view. Scale line = 10 mm.





Figures 3, 4.—Mesosomal segment VII and proximal metasomal segments of anomalous *Centruroides vittatus*. 3, Dorsal view; 4, Ventral view.

The present specimen of *C. vittatus*, an immature female, most likely in the fifth instar, was collected by L. Feldick on 4 November 1988 at Kinta, Haskell County, Oklahoma. It is very similar to the specimens of *A. crassicauda*, *H. alticola*, and *C. gracilis* illustrated in Millot & Vachon (1949), Vachon (1953), and Armas (1977), respectively. It also generally matches the specimen of *C. exilicauda* described by Williams (1971). The two metasomas and telsons are fully formed and the carination of the metasomal segments is normal. Each metasoma bears an anus ventrally at the end of the fifth segment. It is quite probable that each metasoma and telson was fully functional.

The seventh mesosomal segment is quite abnormal, as would be expected in order for it to accommodate two metasomas. The tergite (Fig. 3) terminates posteriorly in a distinct triangular projection between the origins of the two metasomas. The lateral keels of the tergite are relatively normal, but the median keel is posteriorly bifurcate. The sternite is even more aberrant (Fig. 4). Its posteromedial margin bears a narrow, deep, concave indentation, and there is an irregularly-shaped boss and ridge along the posterior midline. This structure is flanked laterally by four pairs of keels (normal specimens have only four keels total – two submedians and two laterals – on the same sternite). Five pairs of setae are symmetrically placed on the sternite as shown in Fig. 4.

We thank D. C. Arnold, curator of the Emerson Entomological Museum, Oklahoma State University, for loan of the specimen and our wives for assistance with translating the literature. The photographs were taken by D. J. Lyons of the NCSM Exhibits Department; we are grateful for his efforts.

LITERATURE CITED

Berland, L. 1913. Note sur un Scorpion muni de deux queues. Bull. Soc. Entomol. France, 18:251–252.

Brauer, A. 1917. Ueber Doppelbildungen des Skorpions *Euscorpius carpathicus* L. Sitz. Ak. Wiss. Berlin, 1917:208–221.

Campos, F. 1918. Algunos casos teratologicos observados en los Artropodos. Ann. Ent. Soc. America, 11:97–98.

de Armas, L. F. 1977. Anomalías en algunos Buthidae (Scorpionida) de Cuba y Brasil. Poeyana, 176: 1–6.

Franganillo, P. 1937. Un monstruo aracnológico. Mem. Soc. Cubano Nat. Hist., 11:55.

Millot, J. & M. Vachon. 1949. Ordre des Scorpions. Pp. 386–436 *In* Traité de Zoologie (P.-P. Grassé, ed.), Masson et Cie, Paris, 6:1–979.

Pavesi, P. 1881. Toradelfia in uno Scorpione. Rend. Inst. Lombardo, vol. 14.

Vachon, M. 1953. The biology of scorpions. Endeavour, 12:80–87.

Williams, S. C. 1971. Developmental anomalies in

the scorpion *Centruroides sculpturatus* (Scorpionida: Buthidae). Pan Pacific Entomol., 47:76–77.

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